DOCUMENT RESUME

ED 365 465 PS 022 016

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TITLE Critical Thinking: Developing a Critical Thinking Environment for Child Development Students.
PUB DATE 12 Nov 93
NOTE 13p.; Paper presented at the Annual Conference of the National Association for the Education of Young Children (Anaheim, CA, November 10-14, 1993).
PUB TYPE Guides - Classroom Use - Teaching Guides (For Teacher) (052) -- Viewpoints (Opinion/Position Papers, Essays, etc.) (120) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Child Development Specialists; *Classroom Environment; Classroom Techniques; Cognitive Processes; *Critical Thinking; Early Childhood Education; Higher Education; Metacognition; *Preservice Teacher Education; *Teaching Methods
IDENTIFIERS Active Learning

ABSTRACT

Critical thinking (CT) teaching strategies are an effective way for teacher educators, especially those of child development students, to help students understand the individual nature of the learning process, the need for dialogue and interaction, and the need for students to be able to apply theory to practice. CT involves the ability to use what one knows about the world, including feelings and intuition, to evaluate the quality of conclusions. CT strategies include aspects of active learning, but with greater expectations. Students are expected to use their available metacognitive abilities to analyze their own performance, and evaluate and make use of their own abilities and talents as well as the abilities and talents of other students. Appendixes provide a list of differences between active learning and CT, an example of a CT individual group activity, and an example of a CT cooperative group activity. (MDM)

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Critical Thinking: Developing a Critical Thinking Environment for Child Development Students

A Paper Presented at
The National Association for the Education of Young Children
Conference
November 13, 1993

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Critical thinking teaching strategies are consistent with early childhood theory and practice. In college classrooms for early childhood educators instructors understand the individual nature of the learning process, the need for dialogue and interaction, and the need for students to be able to apply theory to practice. College instructors understand that the process of memorizing and learning many facts ultimately may become useless information, often irretrievable (Browne & Keeley, 1990). Delivering information through a traditional lecture/notetaking format results in the compiling of information which may or may not be useful to the student at a later time. Studying and attempting to apply critical thinking concepts to the teaching of child development or early childhood education should feel appropriate and consistent to college instructors in this field.

In order to bring about critical thinking in college classrooms instructors will have to stretch their practice beyond what has been typical. Many current instructors use good active learning strategies for their students. However, critical thinking goes beyond those active learning experiences and requires the instructor to spend less time on content areas, and teach students specific critical thinking skills. Active learning experiences enhance the probablitily of critical thinking, but they do not insure the use of critical thinking. We need to train early childhood teachers who can observe, gather information, evaluate the quality of that information, determine whether more information is needed, see a problem from differing perspectives, and come to conclusions about the handling of children's and families' problems that are based upon both the best and the most relevant information available. We must teach specific critical thinking skills, if we want the use of such skills to infuse early childhood practice.

Before we differentiate active learning and critical thinking strategies we must have a clear definition of critical thinking. Unfortunately, critical thinking experts do not agree on a definition (Browne & Keeley, 1992). I recommend that instructors build their own definition as they begin the process of infusing critical thinking into their teaching practice. A good place to begin is with a current definition. Carol Tavris and Carole Wade say, "critical thinking is the ability and willingness to assess claims and make objective judgement on the basis of well-supported reasons" (Esterle & Clurman, 1993).

In addition I believe we must take into account feelings and intuition in critical thinking. Recently, I was leading a group of traditional-aged undergraduates in a discussion of critical thinking. I asked them the question, "What role do feelings play in critical thinking?" A brash young man blurted out, "Feelings interfere with critical thinking." A young woman raised her hand and when called upon offered the opinion that feelings are the beginning of critical thinking.

I agree with the young woman that feelings must be acknowledged, and allowed their space in a person's reality before and during critical thinking experiences. Otherwise, any quality critical thinking may be unwittingly biased. As for intuition, I believe that intuition is knowledge that lacks metacognitive analysis. In other words, people know things, but they don't know how they know, or what specific knowledge they have that allows them to know. So, hopefully critical thinking processes will help us to understand our intuitive understandings more thoroughly. Intuition should never be dismissed as irrelevant or outside the purview of critical thinking. It should be included as a part of the process.

My definition of critical thinking, then, includes an acceptance of both feelings and intuition, but adds the component of metacognitive analysis, and asks that opinion be supported by reasons which are logically related to the conclusion. I would say that critical thinking is the ability to use what we know of the world including our feelings and intuition to evaluate the quality of our conclusions.

The difference between active learning strategies and critical thinking strategies is important to clarify. Active learning (AL) strategies accept that students construct their own knowledge, and thus, create active involvement of the students in the learning environment. Involvement includes interaction and dialogue between students, among small groups of students, and between students and instructor. When AL strategies are used the range of content may have to be reduced in order to involve students, and thus students can be expected to have time to more thoroughly process information. AL strategies expect students to be able to apply what they know to real life situations. Students are put in charge of their own learning, and cooperation instead of competition are encouraged in the classroom (Luckey, 1992). (see examples Appendix 1).

Critical thinking (CT) strategies employ all of the above aspects of active learning, but they expect more. Students are given more time and they are expected to be involved, but they are expected to use their available metacognitive abilities to analyze their involvement, evaluate and make use of their own abilities and talents as well as the abilities and talents of the other students. Students are expected to be able to create something new out of their learning. But, perhaps the most important difference between AL and CT is that students must be able to openly disagree and come to evaluate the quality of each others' opinions. We must teach students that to be open-minded means that one listens to other perspectives, ideas, and feelings and asks for good reasons for conclusions. We must teach what a good reason is, and how to evaluate the quality of reasons. Critical thinking means that through an analysis of the assumptions of an opinion, the reasons that uphold it, and the logic that maintains it, we attempt to discern

the quality of the opinion. We must not allow students to assume that all opinions are equal.

In this context open-mindedness requires that we listen carefully to all perspectives, and that we create an academic environment that encourages honest attempts at understanding a variety of perspectives. It also requires that we be open to changing our mind about an issue if there is reason to do so. Instructors must be open-minded, and model willingness to change their minds. But, it does not mean that we accept all opinions as equal. We must teach students to carefully evaluate the validity of each perspective.

Our challenge is that child development students tend to be very warm, accepting people. They do not want to hurt each others feelings, nor do they want to be seen as confrontive. I do not want to change those positive qualities, but I do want students to be able to depersonalize their opinions to the extent that they can critically analyze their own, as well as others'. So, our environments must develop from a safe, open-minded environment in which our students are able to openly share feelings, opinions, and intuitions, toward an environment where students can respectfully evaluate the quality of their conclusions. We must teach good communications skills which build trust and a safety to disagree, we model open-mindedness and promote active evaluation of conclusions. If we do this in a developmental manner, building from good communication skill to trust, to open-mindedness, to ability to evaluate, students will increase their ability to critically think. We must challenge their thinking. Thinking is not easy. Quality critical thinking should not be assumed to be easy, only rewarding when a difficult problem is solved or a complex question is answered.

One of the models I use to evaluate whether I am reaching this critical thinking environment is Bloom's Taxonomy (Bloom, 1956). The taxonomy begins with knowledge. The kinds of questions that can be asked to discover knowledge are: who . . . . . , what . . . . . , when . . . . . , and describe . . . . . Knowledge provides a basis for critical thinking and cannot be left out. If our students don't know anything there is nothing to think about. The second level of the taxonomy is comprehension. Comprehension questions look for organization and selection of facts such as: What is the main idea of. . .? Application is the third level of the taxonomy. Most instructors probably bring their students to this level of thinking. The need for application of theory and principle is particularly important in early childhood education. College classrooms that I have visited generally ask students to be able to apply their knowledge. But this is the level where many instructors stop, thus never reaching critical thinking skills for their students.

The last three levels are analysis, synthesis, and evaluation. Analysis requires that parts of a whole be separated, classified, organized, compared and contrasted. Synthesis combines parts of ideas to form a new whole. Evaluation requires the development of criteria for evaluation, or the logical organization of evidence to support a conclusion.

It is difficult to get to the evaluation level, and it is not always reached in our classrooms. But we must be willing to assess whether we are getting there, and how we could achieve it more often. Let me give an example. I teach a unit on classification within Piaget's theory. I use several active learning techniques as I engage the students in a lecture discussion of classification as it relates to the preoperational and concrete operational stages of development. The technique I find most useful in this process is think/pair/share (Fogarty & Bellanca, 1989). I give the students a question to think about, give them two minutes wait time, and ask them to share with their neighbors. Next, I show the students a video demonstrating multiple classification, class inclusion, and heirarchal classification. In their cooperative groups I ask them to develop their own classfication activities without using the categories used in the video. The activity is difficult, but once students are able to find one set of categories that works, they quickly think of many. They feel a sense of competence and accomplishment. But, at this point we have done no evaluation or development of criteria for evaluation. We have done no critical thinking. The step that gets us closest to critical thinking is to ask groups to evaluate each others activities. Following are a set of questions that can be used with this activity that move through the taxonomy:

1. Describe Piaget's view of classification. (Also multiple classification, class inclusion, and/or heirarchical classification.)
2. What are the main point of Piaget's view of classification?
3. How is multiple classification related to class inclusion? How are they different?
4. Design your own multiple classification activity for the age group with which you work.
5. Evaluate the classification activities done by other groups in the class.

Questions are a good way to enhance thinking. Consider the questions you ask students and to what level of the taxonomy the question belongs. For example, if I ask you a question about the differences between active learning and critical thinking it would be at the first or second level of the taxonomy. But, a question that would ask you to observe in a classroom and evaluate the classroom for critical thinking comes closer to an evaluation level of the taxonomy and thus closer to real critical thinking.

I use two type of classroom activities, large group and small group. Some of the large group activites are described in Appendix 1. It can be noted that they are basically active learning strategies that have critical thinking questions added to them. I also use

several "find someone who" activities, in which I ask students to get up out of their chairs and find classmates who are willing to fill in their name in a box that fits them, or that they can define or describe. At this point it is still an active learning experience. But, when I bring them back for debriefing I ask several CT questions. An example of this kind of activity is in Appendix 2.

I also use many cooperative group activities. (See Appendix 3 for example). I have developed my approach to cooperative groups out of the work of Johnson & Johnson (1991). I assign students to groups that are relatively consistent throughout the semester. The groups must be integrated by age, sex, student achievement level, amount of child development background, etc. The groups meet at least once a week and I ask them to turn in two reports to me each time they meet--a content report, and a process observer report (Appendix 4 has a copy of the groups instructions). I meet with all of the groups regularly, I am always available for questions and will help any group that wants or needs it. My personal monitoring of the groups is the key to their effective functioning. I have had many frustrations in the past with adult cooperative groups, and I hear those frustrations from other instructors. . . . "Some group members aren't carrying their weight. Some groups members aren't prepared. . . etc." There is no magic to creating functional groups, but the instructor behaviors that support the process the most are:

1. Personal instructor monitoring and availability
2. Groups are integrated by ability
3. Goal of success for each group member is emphasized
4. Development of good communication skills (I encourage them to use phrases such as "I see it differently" or "I understood that concept or conclusion in another way." Thus students can come to see their differing perceptions and try to figure out why.)
5. Occasional change in group membership if necessary
6. As the students learn more content, increase the complexity of CT questions for them to consider (Remember that CT is based on content, so content knowledge must never be overlooked)

Instructors must create their own approach to critical thinking. There are many more strategies available, some of which can be found in the materials in the bibliography. But, I believe that we must become passionate in our approach to the teaching of critical thinking skills. Whether we are novices, or have already begun the process, or are becoming experts, we owe it to a democratic society to teach people to think about what they know and don't know, evaluate the quality of conclusions and come to conclusions of their own which are more likely to be sound, and more functional than those accepted without analysis.

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Appendix 1

DIFFERENCES BETWEEN ACTIVE LEARNING AND CRITICAL THINKING

ACTIVE LEARNING STRATEGIES (AL)	CRITICAL THINKING STRATEGIES (CT)
1. Require student involvement in learning	Requires student to analyze involvement
2. Slows down the learning process to give time for processing information	Slows down to give thinking time for evalution of information
3. Expects students to be able to apply	Expects students to be able to create
4. Students in charge of own learning	Students in charge of thinking
5. Encourages cooperation in learning	Encourages open discussion of differences

SPECIFIC STRATEGIES USEFUL IN BOTH ACTIVE LEARNING AND CRITICAL THINKING

1. **Wrap around**--Ask a question, wait one minute (see wait time), have each student give a quick one sentence response. Example, AL--ask each student to give one example of preoperational thinking. CT-Questions used in wrap around must require analysis or evaluation. Example, CT--ask each student to provide evidence of preoperational thinking in an individual child's behaviors.
2. **Wait time**--Stop every so often and ask students to think about what is being discussed. Wait for at least one minute after asking question. Wait before giving response. Wait before calling on next person. Try waiting two minutes (it's a long time!). Example AL--What are the main stages of prelinguistic development. CT--What evidence exists that prelinguistic development is related to language development?
3. **Think/pair/share**--Invite students to think about a question for a minute. Share their ideas with a partner and then with the group (small or large). Example, AL--Describe Erikson's stage of Trust vs. Mistrust. Example, CT--Do you agree with your partner's description? Why or why not?
4. **Describe understanding**--Ask a student to describe in their own words something that has just been explained either by teacher or another student. Example, AL--Give a definition for assimilation in your own words. CT--Follow-up with a critical thinking question such as Do you agree with the definition, why or why not?
5. **Summarize**--Ask one or two students to summarize in their own words something that has just been described or explained. CT--Ask for examples that would support the summary.
6. **Review notes**--stop a lecture or discussion, ask students to work in groups of two or three and review each others notes, filling in and writing down questions. Review questions with whole group. CT-- You can use their questions to turn them into critical thinking questions, sometimes. Such as if they have reviewed each others notes on developmentally appropriate practice, then you could ask them to describe classrooms they have been in and evaluate the developmental appropriateness of the classroom by providing evidence for their conclusion.
7. **Questions**--Ask many questions and encourage students to ask questions. Make your questions as specific as posssible. Elicit multiple responses by asking the same question of more than one student. Promote the idea that sometimes there are many answers. Example AL--What have you seen in classrooms of four year olds that demonstrates developmental apropriateness? Example CT--Evaluate another students description.
8. **Case studies**--CT--Bring in anecdotes of children's behavior that are detailed enough to be used as case studies. Ask students to consider such things as developmental needs of children involved, methods of assessment, appropriate responses on the part of adults involved, and then ask them to evaluate each others answers.

Appendix 2

Find Someone Who:

Is left handed	Was good in school	High self-esteem in childhood
Had a chronic disease	Has a photographic memory	Grew up in a single parent family
Felt uncoordinated in childhood	Has a sense of life-control	Was affected by an historical event
Was overweight as a child	Had late language development	Had more than four siblings
Was skilled at a sport	Was better at English than math	Grew up in a nuclear family
Was said to be cute or good looking	Enjoyed reading as a child	Felt different than peers in some way

Critical thinking questions:

What did you learn about development from this activity?

What similarities do you see in the columns?

Which of the above characteristics are influenced by biological nature, and which environmental, nurture?

Appendix 3

Compare and Contrast

Erikson's Theory Piaget's Theory

How are they alike?

_____

_____

_____

_____

_____

How are they different?

with regard to:

_____	Life-span	_____
_____	Psychological issue	_____
_____	Dynamics of stages	_____
_____	Effect on Education	_____
_____	_____	_____
_____	_____	_____

Appendix 4

Cooperative Groups

Most weeks you will meet with your assigned cooperative group for a portion of class time. The purpose of cooperative groups is twofold. First, I want students to learn to work positively in a group, and improve their interactional skills. Second, I want students to listen to and take into consideration differing points of view in order to improve their critical thinking skills. Each time the group meets I will expect each person to have a role in the group. The roles will rotate. Groups will be assigned. I will receive two reports from each group at the end of every group meeting, one from the recorder and one from the process observer.

The primary goal of the groups is to take collective responsibility for the learning of the material, and the increased ability of individuals to think critically. The group is successful if everyone is participating, everyone is contributing by coming prepared, you listen carefully to how each of you understands and is able to apply concepts, and you are all feeling successful!

Following are the roles to be assigned on a rotating basis:

1. Discussion leader: this person will encourage each person in the group to share an opinion or information, will try to keep any one person from dominating, will accept everyone's opinion without judgment, will accept disagreements, will ask each person questions such as why, and on what evidence an opinion is held, and will maintain respectful dialogue.

2. Process observer: this person will listen to the whole group and observe body language and other evidence that indicates how interested the group is in this topic, whether it appears everyone has come prepared, whether everyone had a chance to talk, whether open-mindedness existed, and people were willing to give reasons for opinions etc. This person will also look for evidence that critical thinking is occuring. The process observer will turn in a report to the instructor at the end of every group meeting.

3. Recorder: this person will record the content of the group discussion, including questions that come up, and how they are addressed. Sometimes there will be a form for recording.

4. Time keeper: this person will keep track of time, will encourage the group to focus if time is running out, and will remind the group of how much time they have to complete the task.

Interactional skills to be used in cooperative groups

Clearly communicate ideas and feelings.
Own your own ideas by using "I think, feel, etc."
Make message complete and specific.
Make verbal and non-verbal messages congruent.
Ask for feedback concerning the way in which your messages are being received.
Paraphrase accurately and nonevaluatively the content of the message of the feelings of the sender

Critical Thinking
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